Printed Pages : 3

NEE405

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : **121412**

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

SENSOR & INSTRUMENTATION

Time : **3** Hours] [Total Marks : **100**

Note : (i) Attempt **all** questions.
(ii) **All** questions carry equal marks.

1 Attempt any **four** parts of the following : **(5×4=20)**

(a) Write short note on smart sensor.

(b) Explain the working principle of LVDT with the help of neat sketch and characteristics. Explain the advantages and disadvantages of LVDT.

(c) Explain the working of ultrasonic flow meter in brief.

(d) Discuss the working of thermocouple sensor for the measurement of temperature.

(e) Explain piezoelectric pressure transducers. Write its advantages and disadvantages.

(f) A linear resistance potentiometer is 5 cm long and uniformly wound with a wire having a resistance of $10k\Omega$. Under normal conditions the slider is at centre of the potentiometer. What will the linear displacement when resistance of potentiometer is measured as (i) $3.8k\Omega$ (ii) $8.3k\Omega$.

2 Attempt any **two** parts of the following : **(10×2=20)**

(a) Draw the circuit diagram of a first order low pass filter and derive its transfer function.

(b) Explain the working of envelop detector with circuit diagram.

(c) Explain the Wheatstone Bridge used for the measurement of resistance.

3 Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain the purpose of Time division multiplexing in telemetry system.

(b) Explain the working of LCD and differentiate between light scattering and field effect types of LCD.

(c) Describe the working of Successive approximation technique used in ADC.

4 Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain the typical features and advantages of LABVIEW.

(b) Draw and explain the difference between traditional instruments and software based virtual instruments

(c) Two resistors have the following rating :

$R_1=36\,\Omega$ + 5% and $R_2= 75\,\Omega$ + 5% , calculate

(i) The magnitude of errors in each resistor.

(ii) The limiting error in ohm and in percentage when the resistors are connected in series

(iii) Relative error and percentage relative error when resistors are connected in parallel.

5 Attempt any **two** parts of the following : **(10×2=20)**

(a) Describe fruits &vegetable processing through a neat diagram.

(b) Explain electronic Nose system & how it is useful for food industry.

(c) Explain different elements of food packaging plant & explain role of robotics in the plant?